Results from Phase II of the

Enhanced Surveillance of Sexually Transmitted Diseases

among Winnipeg Street-Involved Youth Study

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April, 2004

Manitoba

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Acknowledgements

I would like to extend sincere thanks to the following people and agencies:

- Most importantly, the study participants generously shared their time and experiences with the study nurse, and offered invaluable insights into the issues facing street involved youth.
- Margaret Ormond, the study nurse, co-ordinated and conducted all interviews with the participants and provided a wealth of knowledge regarding the concerns and needs of street youth.
- Dr. Stephen Moses of the University of Manitoba, was the principal investigator for this phase of the study, and contributed greatly to the interpretation of these data.
- Dr. Greg Hammond and Ms. Kathy Mestery of the Public Health Branch, Manitoba Health, provided helpful guidance and support to the study.
- Ms. Trina Larsen, HIV/HCV programme co-ordinator, Manitoba Health and Ms. Michelyn Wood, field surveillance officer, Health Canada for their support and insights into the translation of data into action.
- Health Canada, in particular the Centre for Infectious Disease Prevention and Control (CIDPC), funded, and continues to fund, the National Street Youth Enhanced Surveillance Study, from which these data were derived.

Executive Summary

Sexually transmitted infections (STI) have risen across almost all Canadian jurisdictions, and Manitoba is no exception. Manitoba in particular has one of the highest rates of gonorrhoea and chlamydia in the country. In Manitoba, 15-24 year olds in particular have the highest rates, accounting for more than 70% of all chlamydia cases and more than 60% of all gonorrhoea cases. Even within this high-risk group, age-specific incidence rates are likely driven by high rates among a core group of street-involved youth. To better understand the incidence of STI among street youth and the behavioural and social risk factors that place them at risk for infection, Health Canada has funded a national, multi-centred, cross-sectional surveillance study - the Enhanced Surveillance of Sexually Transmitted Diseases among Canadian Street Youth Study. By understanding these risk factors, prevention programmes can better respond to any changes in the epidemiology of these infections among street youth. The major findings of the Winnipeg portion of the study are as follows:

Demographics

- 320 street youth, aged 14-24 years, were interviewed between January – August 1999
- 56% of the sample was male; 53% of the sample self-identified as Aboriginal
- more than half of the sample were not in school; two-thirds had spent at least one overnight in a detention facility

Incidence of STI

- 16% of the sample tested positive for at least one of either chlamydia, gonorrhoea, or hepatitis B: 11.6% positive for chlamydia; 1.9% positive for gonorrhoea; 4.1% positive for core hepatitis B antibodies

STI Risk Behaviours

- 92% of females and 81% of males had some type of sex partner in the last 3 months
- average number of sex partners in last 3 months was 4; many youth had concurrent regular and casual sex partners
- 21% of females and 5% of males were involved in sex trade work in the past 3 months
- 7% of youth injected drugs in the last 2 months, 21% of which injected with a used needle
- only 14% on youth reported consistent condom use with any type of sexual partner; consistent condom usage particularly poor with sex trade partners (5% always used condoms); highest rate of condom use reported for casual sex partners (31% always used condoms)

Psychosocial Correlates

- those with greater self-esteem scores reported greater condom usage and fewer number of sexual partners
- 45% of street youth reported experiencing either sexual, physical, or emotional abuse; one-quarter of the sample reported having a sexual encounter with a family member or other person in position of authority
- youth with a history of sexual, physical, or emotional abuse reported poorer condom usage and a greater number of sexual partners
- most youth reported frequent and good quality contact with at least one parent; youth with a good relationship with at least one parent reported fewer sexual partners
- almost half of the sample consumed alcohol of a weekly basis and 38% reported binge drinking on a weekly basis
- those reporting greater alcohol consumption also reported poorer condom usage, a greater number of sexual partners, and a greater frequency of injecting with used needles

Aboriginal vs Non-Aboriginal Differences

- Aboriginal youth reported more sex partners and greater involvement in sex trade work compared to non-Aboriginal youth
- Aboriginal youth reported less injection drug use, and less use of used needles compared to non-Aboriginal youth
- Aboriginal youth had lower self-esteem scores than non-Aboriginal youth
- Non-Aboriginal youth reported greater and more frequent alcohol consumption than Aboriginal youth

Various programmes and services for street youth currently exist throughout Winnipeg and in rural Manitoba. It is recommended that provincial and local STI prevention efforts be examined and modified or expanded if necessary to meet the evolving needs of street youth. To effectively impact on the transmission of STI among this high-risk group, the influence of a variety of proximate (e.g., condom usage, number of sex partners) and latent factors (e.g., adolescent-parent relationships, self-esteem, effects of abuse) must be addressed.

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RESULTS FROM PHASE II OF THE

ENHANCED SURVEILLANCE OF SEXUALLY TRANSMITTED DISEASES

AMONG WINNIPEG STREET-INVOLVED YOUTH STUDY

Introduction

Sexually transmitted infections (STI), in particular chlamydia (Ct) and gonorrhoea (Gc), are the most frequently reported communicable diseases in North America (Centres for Disease Control (Atlanta), 1996; Health Canada, 1996), and are a significant health concern in Manitoba. The elimination of gonorrhoea and a significant reduction in chlamydia have been proposed as national goals for which Canada should achieve by the year 2010 (Health Canada, 1997). Although witnessing a decline in the number of incident cases during the early and mid-1990s, rates of both chlamydial and gonococcal infections have been increasing across the country since the late 1990's (Figures 1 and 2, respectively; Health Canada, 2003). Evident in Figures 1 and 2, comparing Manitoba rates to those for other provinces, Manitoba has the second highest chlamydia rate and the highest gonorrhoea rate in the country (Health Canada, 2003).

Figure 1. Chlamydia Rates per 100,000 by Province, 1999 and 2002.

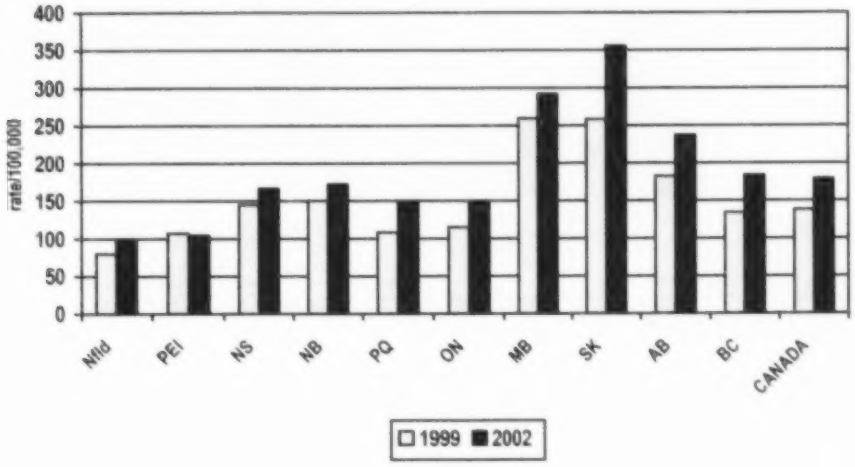
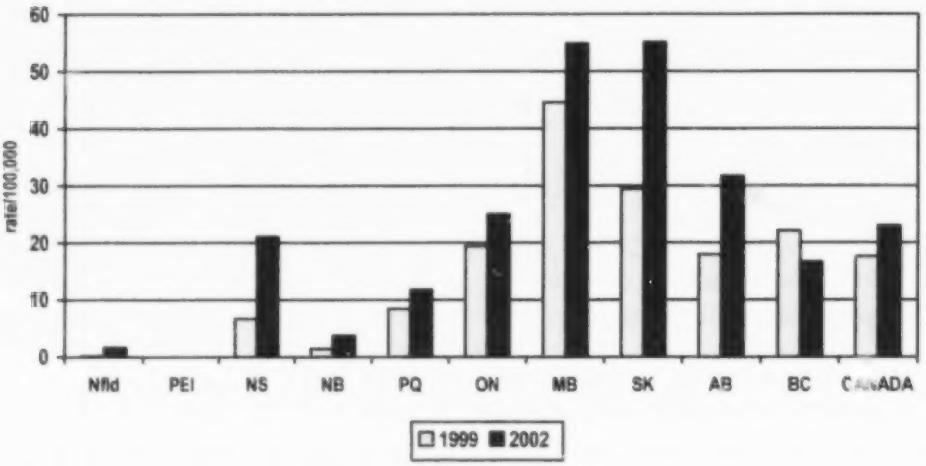
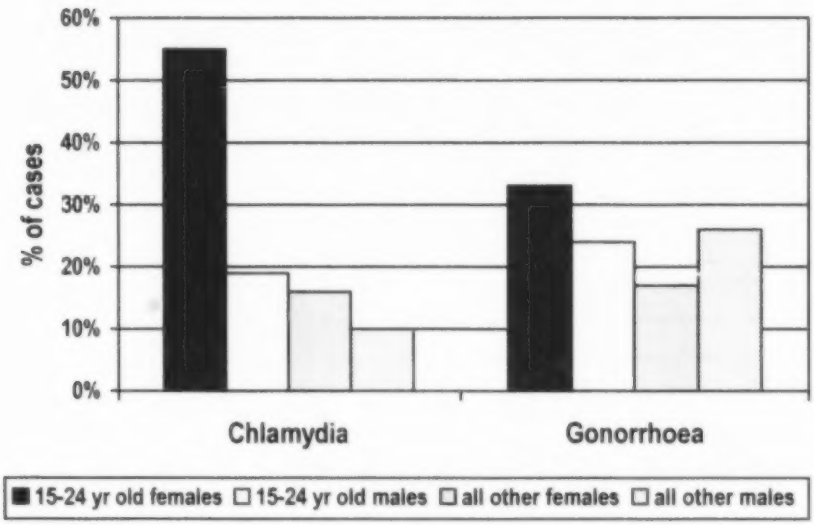


Figure 2. Gonorrhoea Rates per 100,000 by Province, 1999 and 2002.



In Manitoba, both for chlamydia and gonorrhoea, the majority of cases are among 15-24 year olds, with a greater incidence among females (Figure 3).

Figure 3. Gender and Age Distribution of Chlamydia and Gonorrhoea Cases in Manitoba, 1999-2002.



Both nationally and in Manitoba, the overall rates of STI are influenced by very high rates in certain vulnerable segments of the population, such as in First Nations people (Health Canada, 1998a; Elliott, Blanchard, & Mestery, 1998) an among street-involved youth (Health Canada, 1998b). Because of their high STI rates, street-involved youth are a priority for most STI prevention programmes. Understanding the demographic, personality, and behavioural determinants of risk and protection within this group is a necessary step in reducing sexual risk-taking activities and, consequently, STI rates (Anderson, Freese, & Pennbridge, 1994).

In an attempt to provide information on the sexual health and sexual behaviours of Canadian street youth, the Laboratory Centre for Disease Control [now the Centre for Infectious Disease Prevention and Control, Health Canada (CIDPC; circa 2001)] developed the *Enhanced STD Surveillance in Canadian Street Youth* project. This is a national, multi-centre, cross-sectional surveillance system that is to be repeated within the same time period for five consecutive years. Manitoba Health has participated in Phases II and III, and is currently involved in Phase IV. Data collection for Phase II of the study began in January 1999 and ended in August 1999. The purpose of this paper is to report on the Phase II findings of the Manitoba portion of this national surveillance system, with the following objectives:

(1) to describe the demographic characteristics of Winnipeg street-involved youth;

(2) to describe the epidemiological determinants of STI risk among street-involved youth;

(3) to describe the psychosocial determinants of STI risk among street youth; and

(4) to determine the infection rates of chlamydia, gonorrhoea, and Hepatitis B in street-involved youth.

Objective 1:

Demographic Characteristics of Winnipeg Street-Involved Youth

Initially, 10 drop-in/youth centres located in Winnipeg were identified as places where street-involved youth may be accessed. As youth were informed about the study, it was hoped that study participation would increase through a snowball effect (Faugier & Sergeant, 1997). In order to enhance recruitment and compensate street-involved youth for their time, an honorarium of $20.00 was offered to each study participant. To be eligible for participation, individuals had to be:

(a) between 14 and 24 years of age;

(b) able to understand spoken French or English;

(c) able to understand and recognise the purpose of the study; and

(d) in the last six months have either run away from their permanent place of residence for three days or more, or been thrown out of their permanent place of residence for three days or more, or been without a fixed address for three days or more.

Between January and August of 1999, 320 street-involved youth between the ages of 14 and 24 years offered to participated in the Winnipeg portion of the Enhanced STD Surveillance in Canadian Street Youth study. Table 1 shows the sites at which participants were recruited for the study.

Table 1. Breakdown of Winnipeg Recruitment Sites

Recruitment Site	Proportion of Sample
Macdonald Youth Services	5.3%
Manitoba Youth Centre	19.5%
Mount Carmel Clinic	0.3%
Nadinawee	12.2%
Operation Go Home	0.3%
Resources for Adolescent Parents	4.0%
Treatment Resources and Independent Living Supports	0.3%
Training Resources for Youth	3.3%
Self referred/word of mouth	50.2%
Training and Employment Resources for Females	4.6%

Of the 320 youth interviewed, one participant questionnaire had to be removed from the analyses as the interview was largely incomplete. Table 2 indicates the complete age and sex breakdown of the sample. Slightly more than half of the participants were male (56.4%, n=180; 43.6% (n=139) were female). The mean age of the total sample was 17.5 years, with no significant difference between the males (mean=17.7) and the females (mean=17.2).

Table 2. Age and Sex Distribution of Winnipeg Street Youth Study Participants

Age of Participants (in years)	***Males***		***Females***		***Total Sample***	
	N	% of Males	N	% of Females	N	% of Total Sample
14	9	5.0	7	5.0	16	5.0
15	16	8.9	17	12.2	33	10.3
16	19	10.6	27	19.4	46	14.4
17	44	24.4	27	19.4	71	22.3
18	34	18.9	33	23.7	67	21.0
19	14	7.8	11	7.9	25	7.8
20	16	8.9	3	2.2	19	6.0
21	12	6.7	3	2.2	15	4.7
22	6	3.3	3	2.2	9	2.8
23	5	2.8	4	2.9	9	2.8
24	3	1.7	2	1.4	5	1.6
Missing	2	1.1	2	1.4	4	1.2
Mean (std)	17.66 (std=3.30)		17.23 (std=2.32)		17.47 (std=2.92)	

In addition to representation in all age categories between 14 and 24 years, the sample was also representative of a variety of racial backgrounds. The majority of the youth self-identified as either Aboriginal (53.0%; n=169) or Caucasian (39.2%; n=125). In addition, 3.4% identified their racial group as Black, 0.9% as Hispanic, 0.3% as Asian, 1.3% as Jamacan, and the remaining 1.9% as other. Other characteristics of the sample that distinguish them from a more traditional sampling of youth (i.e., those that are not street-involved) include school involvement and encounters with the law. More than half of the street youth sampled (n=176, 55.2%) were not registered for school. Additionally, two-thirds of the sample (n=213, 66.8%) admitted having been in trouble with the law to the extent that they spent at least one overnight stay in a detention facility.

The psychological and the epidemiological literature have both tackled the topic of risk factors for sexually transmitted infections, each with a different focus. While the epidemiological literature tends to focus on very direct determinants of risk, such as rate of partner exchange and condom usage, the psychological literature tends to implicate more indirect factors, like childhood events (e.g., abuse history), interpersonal relationships, and self-esteem. Both paradigms were examined in this research, and each category of determinants are examined in this paper.

Objective 2:

Epidemiological Determinants of STI Risk among Winnipeg Street-Involved Youth

The current study examined a myriad of risk factors, including those that directly influence bacterial or viral transmission, and those that indirectly influence transmission via their psychosocial impact on decision-making processes. The more direct, or proximate, risk factors, denoted as epidemiological determinants in this paper, include number of sexual partners, use of condoms, and injecting with used injection drug use (IDU) equipment.

Number of Recent Sexual Partners

The spread of STI in a population is partly dependent on the rate of new partner acquisition (Wasserheit & Aral, 1996). Basically, the more sexual partners one has, the greater the STI risk simply by virtue of more opportunities for transmission. For each type of sexual partnership (e.g., regular, casual, client, same sex, opposite sex), participants were asked how many sexual partners they had been with in the last three months. The average number of sexual partners was 4.0, with a range of 0 to over 100 (e.g., sex trade work). Reflecting greater involvement in sex trade work, females reported more sexual partners than did males (4.93 vs 2.99; $F_{(1,318)}=5.79$, $p<.05$). In addition, Aboriginal youth reported more sexual partners compared to the remaining participants, again reflecting greater involvement in sex trade work

(4.67 vs 2.90; $F_{(1,318)}$=4.83, p<.05). Table 3 shows the type and frequency of recent sexual partnering by gender. The overwhelming majority of both female and male study participants reported having a sexual partner within the last three months, and for many, multiple concurrent relationships were reported – in particular concurrent regular and casual partners.

Table 3. Type and Frequency of Sexual Partnering among Winnipeg Street-Involved Youth

Type of Sexual Partnering	Females			Males		
	Number of Respondents (%)	# of Sexual Partners	Mean Number of Sexual Partners	Number of Respondents (%)	# of Sexual Partners	Mean Number of Sexual Partners
Regular Partner	102 (73.4%)	1 - 3	X=1.12, std=0.41	93 (51.7%)	1 - 4	X=1.22, std=0.57
Casual Partner	69 (49.6%)	1 - 10	X=2.51, std=1.86	94 (52.2%)	1 - 20	X=3.28, std=3.58
Client Partner	30 (21.6%)	1 – 55	X=13.27, std=15.85	9 (5.0%)	2 – 31	X=13.00, std=11.08
Any Type of Partner	129 (92.8%)	1 – 55	X=5.31, std=9.63	147 (81.7%)	1 – 31	X=3.66, std=5.01

Use of Clean Injection Drug Use Equipment

Risk of hepatitis B virus (HBV) was also assessed in this study. As HBV is mainly transmissible through blood, the sharing of injection drug equipment (that may contain blood from a previous injection) greatly increases one's risk of contracting HBV. About 7 % of the street youth sampled reported using injection drugs within the last three months. Of these current users, most used clean needles with each injection, although 21.7% reported injecting with a used needle. Of the respondents who reported having used injection drugs at some point in their lives (but not necessarily in the last three months; n=62), 22.5% reported injecting with used equipment at least some of the time. Non-Aboriginal youth reported greater injections with used needles than their Aboriginal counterparts (0.18 vs 0.02; $F_{(1,318)}$=19.21, p<.0001). There were no observed differences in unclean needle usage between males and females.

Current Frequency of Condom Use

With the exception of abstinence, proper use of a latex condom during penetrative sexual activity is the best protection against contracting a STI. For each type of sexual partner, participants were asked how

often they use condoms. Seen in Table 4, frequency of condom use varied greatly by type of sexual partnering. In particular, while 14% of those with any type of sexual encounter in the last three months reported always using a condom, this figure ranged from a low of 5% with client sex partners, to a high of 31% with casual sex partners. There were no significant differences in frequency of condom usage between Aboriginal and non-Aboriginal youths. Gender differences were observed, with females reporting greater condom usage than males (4.69 vs 3.41; $F_{(1,318)}=14.14$, $p<.005$).

Table 4. Frequency of Condom Use among Winnipeg Street-Involved Youth by Type of Sexual Partner

Type of Recent Sexual Partnering	Total Sample		Females		Males	
	# of Youth	% of Youth	# of Females	% of Females	# of Males	% of Males
Regular Sexual Partner	195		102		93	
Always used a condom	46	23.6%	16	15.7%	30	32.3%
Used a condom most of the time	45	23.1%	26	25.5%	19	20.4%
Used a condom half of the time	87	44.6%	55	53.9%	32	34.4%
Used a condom sometimes	3	1.5%	2	2.0%	1	1.1%
Never used a condom	4	2.0%	3	2.9%	1	1.1%
Casual Sexual Partner	163		69		94	
Always used a condom	51	31.3%	22	31.9%	29	30.9%
Used a condom most of the time	40	24.5%	9	13.0%	31	33.0%
Used a condom half of the time	67	41.1%	35	50.7%	32	34.0%
Used a condom sometimes	3	1.8%	3	4.3%	0	0%
Never used a condom	2	1.2%	0	0%	2	2.1%
Client Sexual Partner	39		30		9	
Always used a condom	2	5.1%	1	3.3%	1	11.1%
Used a condom sometimes	29	74.4%	22	73.3%	7	77.8%
Never used a condom	8	20.5%	7	23.3%	1	11.1%
Any Type of Recent Sexual Partner	143		129		147	
Always used a condom	19	13.3%	12	9.3%	28	19.1%
Used a condom most of the time	95	66.4%	67	51.9%	81	55.1%
Used a condom half of the time	128	89.5%	47	36.4%	32	21.8%
Used a condom sometimes	35	24.5%	3	2.2%	5	3.4%
Never used a condom	5	3.5%	0	0%	1	0.7%

Reported in Table 4, condom usage is better with casual sex partners than with regular partners. This is problematic as almost three-quarters of youth reported having at least one regular partner in the last three months. Indeed, researchers that have examined length and type of adolescent sexual relationships have identified regular partner relationships as a primary impediment to condom use (Maticka-Tyndale,

1991; Elliott et al., 1998). At issue here is serial monogamy, that is, a high rate of regular sex partner change (Brunham, 1997). The rate of partner change is not the same as the average number of sexual partners at a given time. Some individuals may have relatively few sexual partners, yet could conceivably be more at risk for a STI than individuals who have multiple partners, simply because of poor condom usage with regular partners (Brunham, 1997). Because each regular partner is known and trusted, an individual may improperly assess their STI risk as being low.

Summary of the Relationship amongst the Epidemiological Determinants

Relationships amongst these three proximal risk factors were also examined. A significant relationship was found between frequency of condom usage and number of recent sexual partners, ($r=0.22$, $p<.001$; correlation is positive because condom use scores were reversed), and injecting with used IDU equipment ($r=0.12$, $p<.05$). In other words, participants who reported inconsistent or low condom usage with their sexual partners (an indicator of heightened STI risk) also tended to have more sexual partners and have injected drugs with used equipment. There was no significant relationship between injecting with used IDU equipment and number of sex partners.

Objective 3:

Psychosocial Determinants of STI Risk among Winnipeg Street-Involved Youth

The psychological literature has examined a number of psychosocial factors that indirectly influence STI rates via their impact on both life choices and in-the-moment decision-making processes. The indirect risk factors, referred to here as psychosocial determinants, include self-esteem, perception of risk, child abuse, adolescent-parent relationship, alcohol use, and illicit drug use.

Self-Esteem

Self-esteem refers to personal beliefs about one's abilities and attributes in various domains (Rosenberg, 1965). Researchers consistently find that self-esteem is a valuable predictor of the conditions under which adolescents enter into sexual relationships (Zimmerman, Sprecher, Langer, & Holloway, 1995). In particular, without confidence and self-esteem, adolescents may enter into sexual relationships vulnerable to the desires of their partner.

In this study, self-esteem was assessed using an eleven-item questionnaire in which participants responded to a series of questions related to how they evaluate themselves. Self-esteem scores on this scale ranged 11 to 55. The mean score for the sample was 34.6, with differences observed both by gender and Aboriginal status. Consistent with other studies, female participants had lower self-esteem scores than males (32.45 vs 36.67; $F_{(1,318)}=30.13$, $p<.0001$), and Aboriginal youth had lower scores than their non-Aboriginal counterparts (33.73 vs 36.07; $F_{(1,318)}=8.81$, $p<.005$).

Self-esteem was assessed in relation to the more traditional epidemiological STI risk factors. As self-esteem increased, condom usage also increased ($r = -0.28$, $p<.001$; correlation is negative because condom use scores were reversed), and the number of recent sexual partners decreased ($r = -0.24$, $p<.001$) both of which similarly indicate a lower STI risk. No significant relationship was found between self-esteem and use of used IDU equipment.

Perception of Risk

Perception of risk is often characterised in the literature as being negatively associated with true STI risk. In other words, those who assess their level of risk as being low are expected to engage in riskier behaviour, because they see themselves as somehow immune or invulnerable (van der Pligt & Richard, 1994).

In the current study, after being asked if they'd ever had any of a series of STI, respondents were asked how at risk for contracting a STI they believed they were. Despite being at fairly high risk of

contracting a STI, 62.7% of the street-involved youth perceived themselves as being at little or no STI risk. Additionally, those who had a previous STI did not have a higher perception of risk compared to those with no STI-positive history. Perception of risk did not vary by gender or Aboriginal status.

Significant correlations were found between perception of risk and the epidemiological determinants, however in the opposite direction than expected. As perception of risk decreased, which theoretically should be associated with greater STI risk, condom usage increased ($r = 0.23$, $p<.001$; correlation is positive because condom use scores were reversed), number of sexual partners decreased ($r = 0.21$, $p<.001$), and use of used IDU equipment decreased ($r = 0.12$, $p<.05$). In other words, the lower one's perception of risk for contracting a STI, the more likely one was to use condoms frequently, to have fewer sexual partners, and to use clean/new IDU equipment, all of which indicate a lower risk of contracting a STI.

Child Abuse History

Child sexual abuse has been implicated as a risk factor for poor condom usage, teenage pregnancy, multiple sex partners, and higher rates of STI (Brown, Lourie, Zlotnick, & Cohn, 2000). Elevated STI rates have also been found among women with a childhood history of physical and emotional abuse compared to non-abused controls (Hobfoll, Bansal, Schurg, Young, Pierce, Hobfoll, & Johnson, 2002). In the current study, each participant was asked, separately, if sexual, physical, or emotional abuse was a factor in why left their parents'/guardians' home.

Overall, 45.5% of the sample cited some form of abuse (2.5% sexual, 15.7% physical, and 27.3% emotional) as one of the reasons they left home, and 7.2% cited abuse as the main reason they left home (0.6% sexual, 3.2% physical, 3.4% emotional). There was no difference between Aboriginal and non-Aboriginal youth in reported abuse. Gender differences were observed however, with females reporting more abuse than males (0.88 vs 0.51; $F_{(1,318)}=14.12$, $p<.005$).

As a reason for leaving home, the definition of sexual abuse was left to the participant's interpretation. Under the assumption that each youth may interpret the term "sexual abuse" differently, participants were directly asked if someone in their family, a relative, or person in a position of authority ever had sex with them. Almost one-quarter of the sample (23.5%, n=75) reported that a family member or other person in authority had sex with them. The mean age of the first sexual encounter of this kind was 8.99 years, with no significant difference between males and females.

Assessed against other STI risk factors, as reported abuse history increased, condom usage dropped ($r = 0.13$, $p<.05$; correlation is positive because condom use scores are reversed) and number of recent sexual partners increased ($r = 0.22$, $p<.001$). No significant relationship was found between abuse history and use of used IDU equipment.

Adolescent-Parent Relationship

Social control theory suggests that the presence of a family member in one's social network may be a constraining influence on unsafe sexual behaviour (Ennett, Bailey, & Federman, 1999). In particular, a positive relationship between adolescents and their parents has been found to lower adolescent's risk of engaging in risky behaviours (Jessor, Van den Bos, Vanderryn, Costa, & Turbin, 1995; McBride, Curry, Cheadle, Anderman, Wagner, Diehr, Psaty, 1995). The current study asked participants how often they had been in contact with their mother and/or father in the past three months, and how they would characterise their interactions with each parent (i.e., very good, good, average, bad, very bad).

As indicated in Table 5, 88.1% of the participants reported some contact with their mother in the last three months. Of these participants reporting contact with their mother, 72% saw her regularly, and 64% characterised the quality of their visits as being good or very good. Considerably fewer youth (i.e., 56.4%) reported contact with their father. Of those reporting contact with their father, 52% saw him regularly, and 64% characterised their visits as being good or very good. This parental contact, particularly with the mother, is encouraging given that almost two-thirds of the sample (65.2%) had established

separate residence at the time of interview. There were no observed gender or ethnicity differences in terms of frequency or quality of contact with parents.

Table 5. Description of the Adolescent-Parent Relationship

Indicator of Relationship	Relationship with Mother		Relationship with Father	
	# of Youth	% of Youth	# of Youth	% of Youth
Has been in contact with parent in last 3 months	281	88.1%	180	56.4
Has not seen or spoken to parent in the last 3 months	31	9.7%	84	26.3%
Does not have a mother/father	7	2.2%	55	17.2%
Frequency of contact with parent				
Very irregularly	39	13.9%	51	28.3%
Occasionally, i.e., not every week	39	13.9%	36	20.0%
Regularly, i.e., once or more a week	202	71.9%	93	51.7%
Quality of contact with parent				
Very good	84	29.9%	40	26.7%
Good	99	35.2%	67	37.2%
Average	73	26.0%	35	19.4%
Bad	19	6.8%	18	10.0%
Very Bad	6	2.1%	12	6.7%

Examining the relationship with the epidemiological STI indicators, there was no significant relationship observed between the quantity and quality of the youth-parent relationship and either condom use or use of used IDU equipment. There was however a significant correlation observed with number of sex partners: as adolescents reported a more strained or infrequent relationship with their parents, number of recent sexual partners increased ($r = 0.17$, $p<.01$).

Alcohol Use

Alcohol consumption is frequently associated with risky sexual behaviours, including unprotected sexual activity (Elliott et al., 1998; Hawkins, Catalano, & Miller, 1992). In this study, participants were asked if they'd consumed alcohol in the last three months, and if so, how often. The overwhelming majority of the street youth sampled had consumed alcohol in the past three months (89%). Reported in Table 6, of those who have consumed in the past three months, almost half (46.9%) consumed alcohol on a weekly

basis, and 38.4% reported binge drinking on a weekly basis. While there were no observed gender differences, non-Aboriginal youth reported greater and more frequent alcohol consumption than Aboriginal youth (4.62 vs 3.74; $F_{(1,318)}=8.26$, $p<.05$).

Table 6. Frequency of Regular and Binge Drinking among Winnipeg Street-Involved Youth

Current Alcohol Use	# of Youth	% of Youth
Have you used alcohol in the past 3 months?		
No, I have never used alcohol	11	3.5%
No, I have not used alcohol in the past 3 months	22	6.9%
Yes	284	89.0%
Missing	2	0.6%
How would you classify your alcohol use in the last 3 months?		
Drank less than once per month	63	22.2%
Drank 1-3 times per month	88	31.0%
Drank 1-3 times per week	72	25.4%
Drank 4-6 times per week	34	12.0%
Drank everyday	27	9.5%
During the times that you consumed alcohol in the past 3 months, how often did you binge drink?		
Never	26	9.2%
Binged less than once per month	80	28.2%
Binged 1-3 times per month	67	23.6%
Binged 1-3 times per week	67	23.6%
Binged 4-6 times per week	25	8.8%
Binged everyday	17	6.0%
Missing	2	0.7%

Alcohol consumption significantly correlated with each of the three epidemiological STI risk indicators. As alcohol consumption (both binge and frequency) increased, condom usage dropped ($r = 0.20$, $p<.001$; correlation is positive because condom scores were reversed); number of recent sexual partners increased ($r = 0.14$, $p<.05$); and frequency of injecting with used IDU equipment increased ($r = 0.23$, $p<.001$).

Illicit Drug Use

Similar to alcohol use, illicit drug use is often implicated in STI risk, insomuch as usage may lower one's inhibitions to engage in other risky behaviours (Harvey & Signer, 1995). Participants were asked how often in a typical week in the last three months, if ever, they used non-injection and/or injection drugs. Table 7 shows the type and frequency of non-injection drug use reported. Almost all (98.4%) of the street-involved youth had used non-injection drugs at least once in their lives, and 79.9% had used in the last three months, almost half of whom used on a weekly basis.

Table 7. Type and Amount of Non-Injection Drugs Used by Winnipeg Street-Involved Youth

Non-Injection Drug Use	# of Youth	% of Youth
Have you used non-injection drugs in the past 3 months?		
No, I have never used non-injection drugs	4	1.3%
No, I have not used non-injection drugs in the past 3 months	59	18.5%
Yes	255	79.9%
Missing	1	0.3%
Which drug did you take most often in the last 3 months without injecting?		
Marijuana	231	90.6%
Hash/Hash Oil	1	0.4%
Mushrooms	2	0.8%
Cocaine	3	1.2%
Crack	4	1.6%
Crystal Methalyne	2	0.8%
Acid	11	4.3%
Ectasy	1	0.4%
In a typical week, how often do you take drugs without injecting?		
Use less than once per month	4	1.6%
Use 1-3 times per month	26	10.2%
Use 1-3 times per week	74	29.0%
Use 4-6 times per week	31	12.2%
Use everyday	17	6.7%
Refused to answer	1	0.4%
Don't know	102	40.0%

In addition to non-injection drugs, almost one-fifth of the sample had injected drugs at least once in their lives, and 7.2% had injected in the last three months. Table 8 indicates the type and amount of recent injection drug activity.

Table 8. Type and Amount of Injection Drugs Used by Winnipeg Street-Involved Youth

Injection Drug Use	# of Youth	% of Youth
Have you used injection drugs in the past 3 months?		
No, I have never used injection drugs	254	79.6%
No, I have not used injection drugs in the past 3 months	39	12.2%
Yes	23	7.2%
Missing	3	0.9%
Which drug did you inject most in the last 3 months?		
Cocaine	10	43.5%
Heroin	9	39.1%
PCP	1	4.3%
Mophine	1	4.3%
Others	2	8.7%
In a typical week, how many times do you inject drugs?		
Inject less than once per month	0	0%
Inject 1-3 times per month	4	17.4%
Inject 1-3 times per week	3	13.4%
Inject 4-6 times per week	4	17.4%
Inject everyday	6	26.1
Don't know	6	26.1

Given the low frequency of injection drug use, both non-injection and injection use were combined for analytic purposes. There were no observed gender differences for this combined indicator. Non-Aboriginal youth reported greater and more frequent illicit drug use than Aboriginal youth (4.91 vs 4.22; $F_{(1,318)}=7.44$, $p<.01$). In relationship to the proximate STI risk indicators, illicit drug use significantly correlated only with use of used IDU equipment ($r = 0.37$, $p<.001$), but not with condom use or number of sex partners.

Objective 4:

Incidence of Chlamydia, Gonorrhoea, and Viral Hepatitis B in Winnipeg Street Youth

Study participants were asked to submit both a urine (for Gc and Ct tests) and blood (for HBV test) sample in order to determine current STI status. Urine samples were collected for 93.4% of the sample (n=299), and 85.3% of the street youth (n=272) provided a blood sample for testing at Cadham Provincial Laboratory. Past STI status was identified through self-report.

Of those who consented to urine testing, 11.6% tested positive for Ct and 1.9% tested positive for Gc. Of those who consented to blood testing, 4.1% tested positive for core HBV antibodies, indicating recent infection. In order to estimate the number of youth who had been immunised against HBV, the blood samples were also screened for surface HBV antibodies. Of those who offered a blood sample, 6.6% tested positive for HBV surface antibodies, indicating either past infection or immunisation.

In addition to current STI status, about one-fifth of the youth admitted to having a previous STI, mostly chlamydia, gonorrhoea, and genital warts. Table 9 shows the type of past STI reported by participants.

Table 9. Self-Reported History of Past STI by Winnipeg Street-Involved Youth

Type of Past STI	# of Youth	% of Youth
Chlamydia	61	19.1%
Gonorrhoea	25	7.8%
Genital Warts	12	3.8%
Hepatitis C	7	2.2%
Herpes	5	1.6%
Hepatitis B	3	0.9%
Other STI	5	1.6%

In summary:

- 66.1% (n=211) of the youth had neither a past nor a current STI;
- 17.9% had a past STI but did not test positive for a current one;
- 12.2% did not report a past STI, but tested positive for a current one; and
- 3.8% of the youth had both a past and a current STI.

Combining past and current STI to form an overall STI status indicator, females had a greater STI status score than did their male counterparts (0.70 vs 0.33; $F_{(1,318)}=18.02$, $p<.0001$). Despite being lower on most of the other STI risk indicators, both epidemiological and psychosocial, Aboriginal youth had a greater STI status score than non-Aboriginal youth (0.60 vs 0.37; $F_{(1,318)}=6.87$, $p<.01$).

Discussion

Traditionally, STI risk has been determined by condom use, rate of partner change, and injecting with used IDU equipment. The findings of this study demonstrate that a number of broader psychosocial factors influence these proximate factors and, as such, should be considered when interpreting STI rates.

Most unexpected in the current study is the finding that the relationship between perception of risk and each of the proximate STI risk factors was in the opposite direction than expected. As perception of risk increased, condom use decreased, number of sex partners increased, and use of used IDU equipment increased. This contradicts the theoretical assumption that high-risk individuals may assess their STI risk as low and, thus, be more careless and engage in riskier behaviour (e.g., poorer condom use, greater number of sexual partners). The findings of the current study suggest that perhaps STI risk-associated behaviours are influencing perception of risk, not the other way around. In this way, as condom use becomes more infrequent and number sexual partners increases, perception of risk (accurately) increases.

In other words, the results of this study suggest that perception of STI risk appears to be an accurate reflection, rather than a determinant, of participant's actual STI risk.

Implications for Prevention

Developing effective interventions that assist youth in changing high-risk sexual behaviour practices requires the identification of factors that contribute to risk. As each of the factors examined in this study may present opportunities for targeted prevention and control efforts, one of the public health uses of these results could be to examine their inclusion in STI control strategies that target high risk youth. For example, as self-esteem was related to many of the STI risk factors, greater efforts to institutionalise self-esteem building could be made. Further, if self-esteem is related to a sense of control over the sexual encounter, then perhaps the teaching of negotiation skills and the boosting of self-confidence to use those skills could enhance self-esteem and, both directly and indirectly, lower STI risk.

Another avenue for public health intervention given the current findings is in the area of child abuse. Clearly considerable interpersonal, social, and psychological resources need to be provided to children and youth who have been victimised. Anecdotally, many of the street youth reported a common theme of having been discarded by everybody – first their families, then school, social services, and finally society in general.

The finding that the quality of the child-parent relationship was related to STI history raises the question of whether this and other significant relationships in the lives of high risk youth could be used as a conduit for STI education, skills training, or self-esteem building. Similarly, as alcohol and illicit drug use related to STI risk, perhaps a component of street outreach programmes that target the sexual practices of youth can widen their services to include alcohol and drug related issues, such as prevention, treatment, and harm reduction.

Summary

As young people often have high STI incidence rates, protecting youth is key to stemming the epidemic of STI in Manitoba. The evolution of STI in the province has undoubtedly been influenced by a number of diverse factors, including the changing socioeconomic and demographic characteristics of the population, altered patterns of risk behaviours, emerging social and sexual networks, and the introduction of various disease prevention and control activities (Elliott, Blanchard, Beaudoin, Green, Nowicki, Matusko, & Moses, 2002). As STI evolve in the province, there is a need to respond both to the changing phases of the epidemics, and to the specific underlying and proximate determinants that help to maintain relatively high rates in core populations (Elliott et al., 2002; Wasserheit & Aral, 1996). In 1998 the rate of reported chlamydia cases in Manitoba was more than twice the national average (275 vs 130 per 100,000) and the rate of reported gonorrhoea cases in Manitoba was three times the national average (54 vs 17 per 100,000) (Elliott et al., 2002). While both gonorrhoea and chlamydia have declined since the early 1990s, the recent halt in the declining incidence of infections and subsequent rise in incidence rates suggests that new control strategies are required. There is a need to focus efforts in populations of the province, such as street youth, where rates are the highest and previous progress has been halted (Elliott et al., 2002; Jha, Nagelkerke, Ngugi, Prasada Rao, Willbond, Moses, & Plummer, 2001).

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